

## ABSTRACT

In a dispersion compensation element 10X, a plurality of regions (I) and (II) mutually different in radius and interval of holes 24 are set, and voltages applied at electrodes 30A and 30B are controlled in respective regions (I) and (II) to make variable the sign and the absolute value of chromatic dispersion compensation. In a dispersion compensation system formed by using the dispersion compensation element 10X, an optical pulse picked up from an optical fiber transmission line is monitored, and the amount of voltage applied at the dispersion compensation element 10X is controlled based on its chromatic dispersion information to perform dispersion compensation of the optical pulse propagated through the optical fiber transmission line. Alternatively, dispersion compensation can be performed by varying the carrier density of the waveguide by applying a voltage to change the refractive index of the waveguide.